# H.264 Network Camera

# User’s Manual

# IMPORTANT SAFETY INSTRUCTIONS

1) Read these instructions.
2) Keep these instructions.
3) Heed all warnings.
4) Follow all instructions.
5) Do not use this apparatus near water.
6) Clean only with a dry cloth.
7) Do not block any of the ventilation openings. Install in accordance with the manufacturer's instructions.
8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
9) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
10) Only use the attachments/accessories specified by the manufacturer.
11) Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.


12) Unplug this apparatus during lightning storms or when unused for long periods of time.
13) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

**CALIFORNIA USA ONLY**

This Perchlorate warning applies only to primary CR (Manganese Dioxide) Lithium coin cells in the product sold or distributed ONLY in California USA. "Perchlorate Material - special handling may apply, See www.dtsc.ca.gov/hazardouswaste/perchlorate."

Caution
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type.

These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock does not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

## In USA and Canada, Use Class 2 Power Supply Only

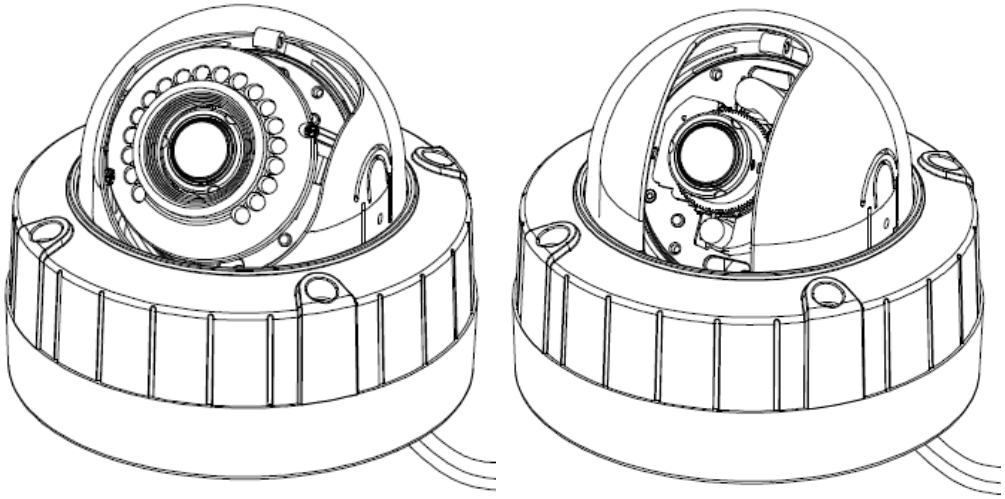
# Contents

# 1. Product Features

The IP VANDAL DOME CAMERA is a high performance H.264 network camera, designed for demanding security installations. It delivers crisp, clear images, disclosing every detail, thanks to its top quality 3.0 Megapixel progressive CMOS sensor and advanced image processing.

Supported by the industry's largest base of video management software, the IP VANDAL DOME CAMERA provides the perfect solution for securing bank offices, airports and other facilities, and for traffic surveillance, over IP based networks.

The optimal Power over Ethernet (IEEE 802.3af) support power to the camera to be delivered via the network, eliminating the need for a power outlet and reducing installation costs. Steady power could be guaranteed with a central Uninterruptible Power Supply (UPS).



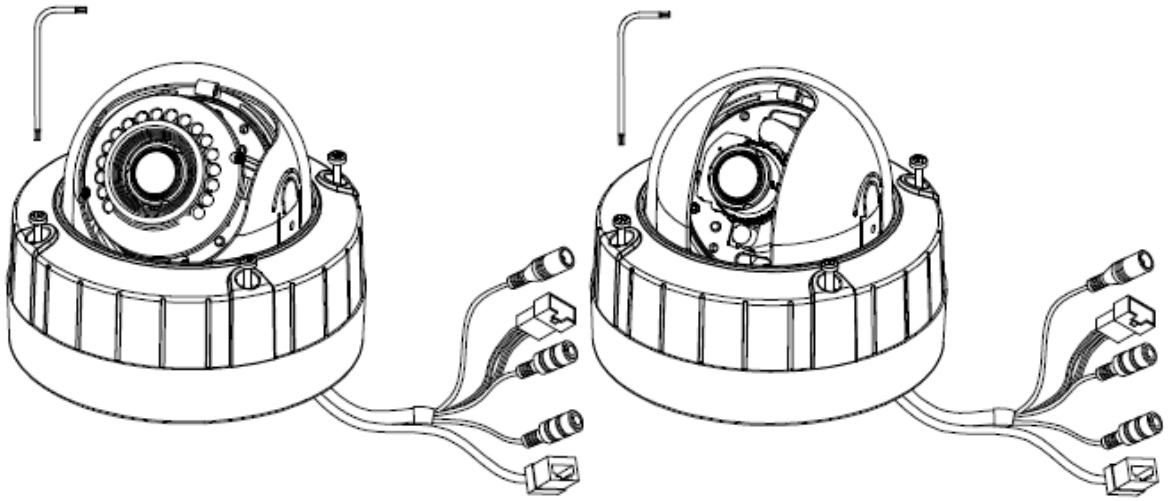
The IP VANDAL DOME CAMERA offers a comprehensive set of network security and management features.
This includes support for port based network control (IEEE802.1X), which allows the camera to be connected to a network secured with this control, and HTTPS encryption, which provides a secure channel between camera and application. It also enables authentication of the video source. Video products are efficiently managed with the powerful IP VANDAL DOME CAMERA Camera Management tool, which is provided on the Installation CD which comes with each IP VANDAL DOME CAMERA camera.

**1. Network connector**
The IP VANDAL DOME CAMERA connects to the network via a standard network cable, and automatically detects the speed of the local network segment (10BaseT/100BaseTX Ethernet). This socket could also be used to power the IP VANDAL DOME CAMERA via Power over Ethernet (PoE). The camera auto-senses the correct power level when using a PoE (Class 2) switch, router or injector.

**2. Reset Button**
Press this button to restore the camera configuration to its factory default settings.

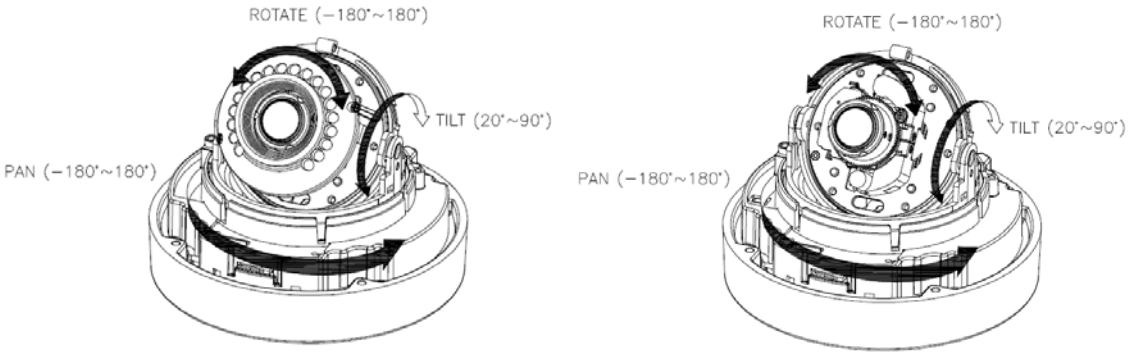
## 3.How to install

1) Remove Dome Cover
 - Loosen four Trox(T20) screws by supplied L-key wrench and remove Dome cover

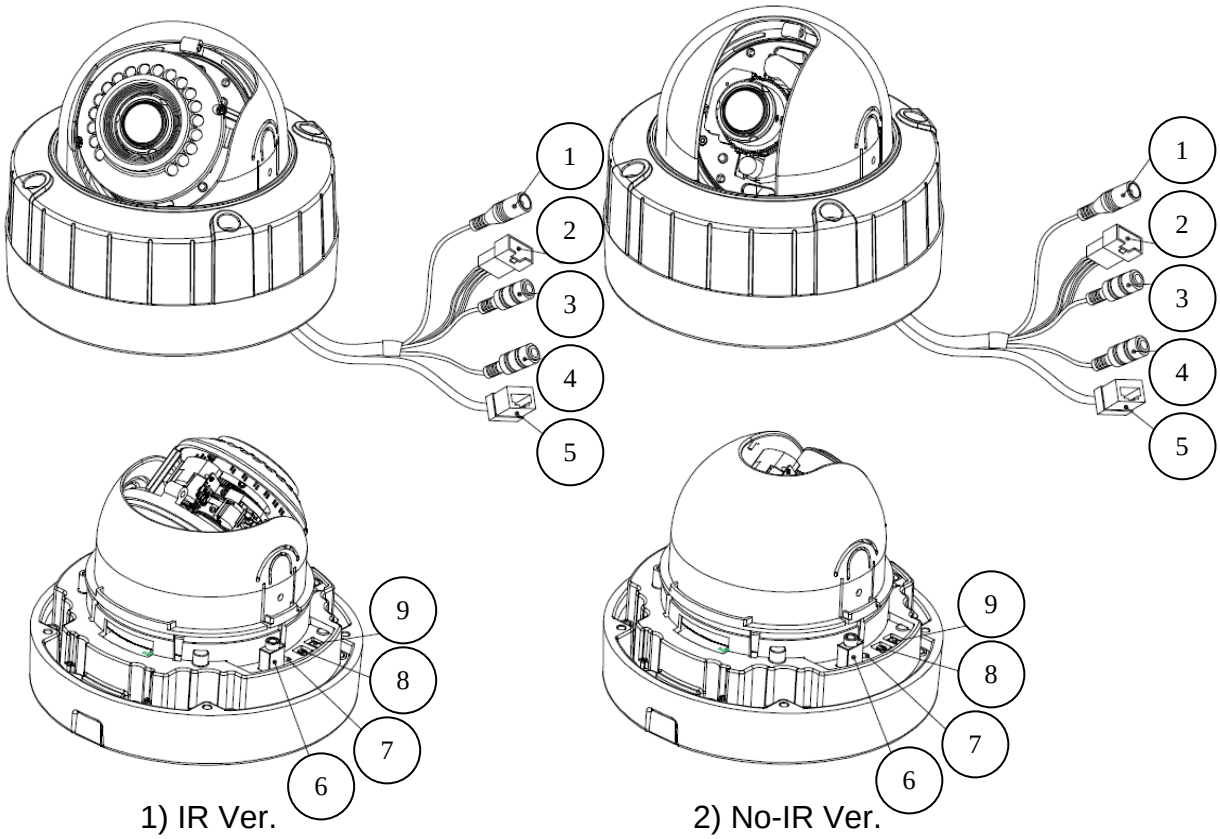


1) IR Ver. 2) No-IR Ver.

2) Control



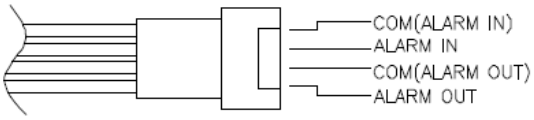

1) IR Ver. 2) No-IR Ver.




1) IR Ver. 2) No-IR Ver.

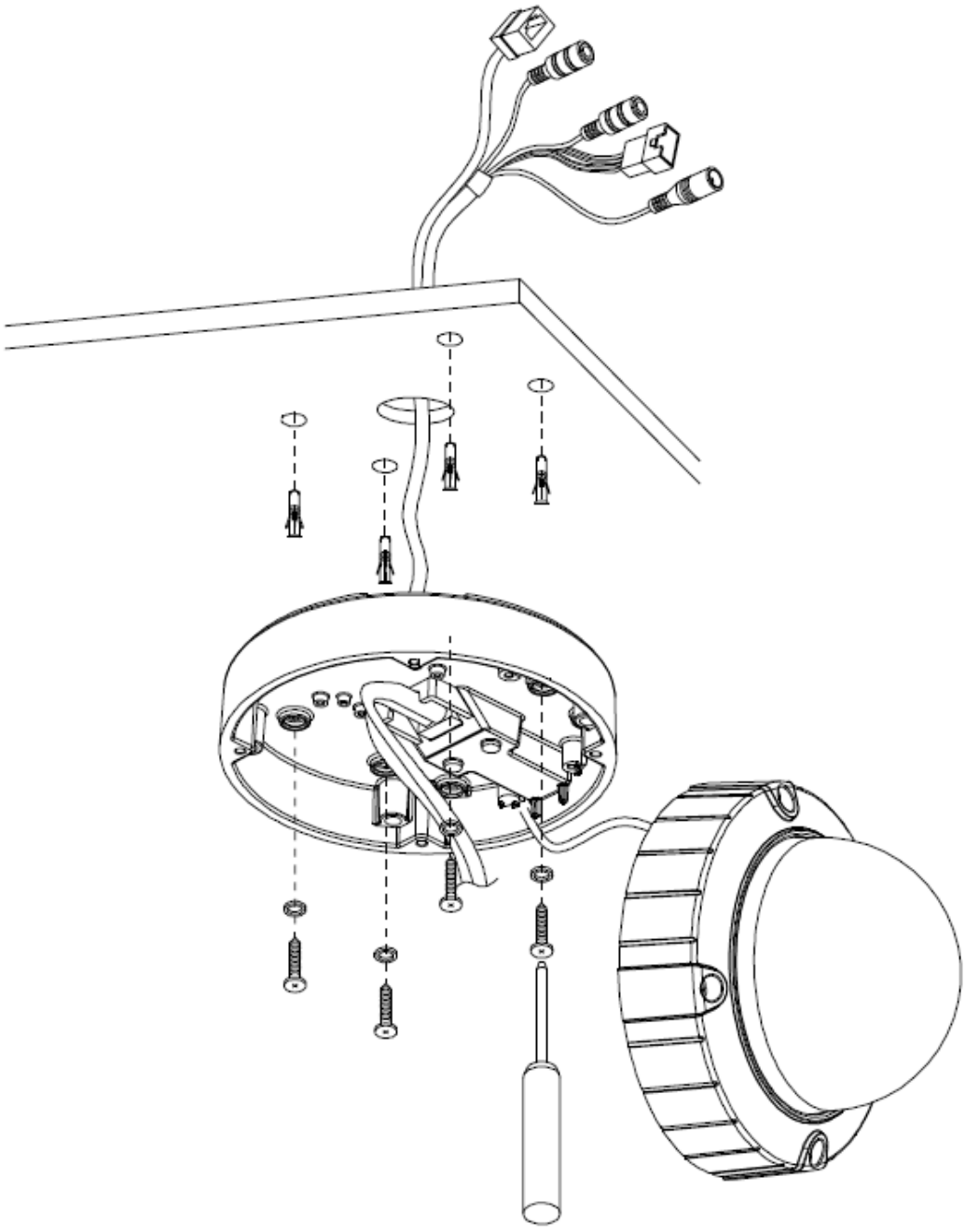
| NO. | DESCRIPTION | NO. | DESCRIPTION |
|---|---|---|---|
| 1 | POWER(RED) | 6 | VIDEO OUT |
| 2 | ALARM IN/OUT | 7 | STATUS LED |
| 3 | AUDIO IN(BLACK) | 8 | CONTROL BUTTON |
| 4 | AUDIO OUT(WHITE) | 9 | HEATER CONNECTOR (OPTION) |
| 5 | NETWORK | | |

– ALARM IN/OUT PIN Assignment –

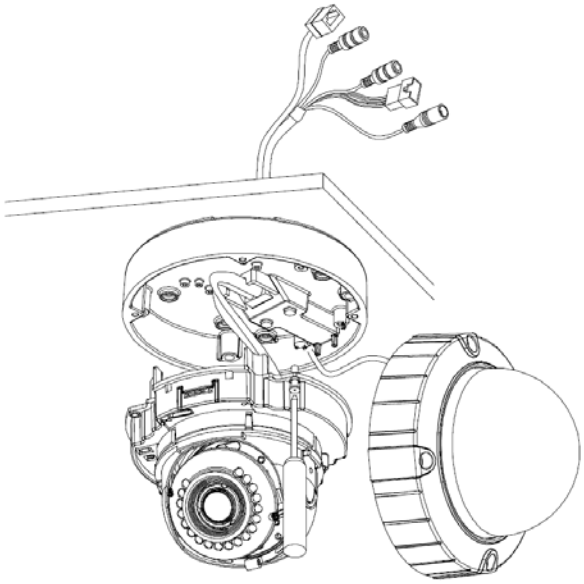


## Mounting to a ceiling / wall

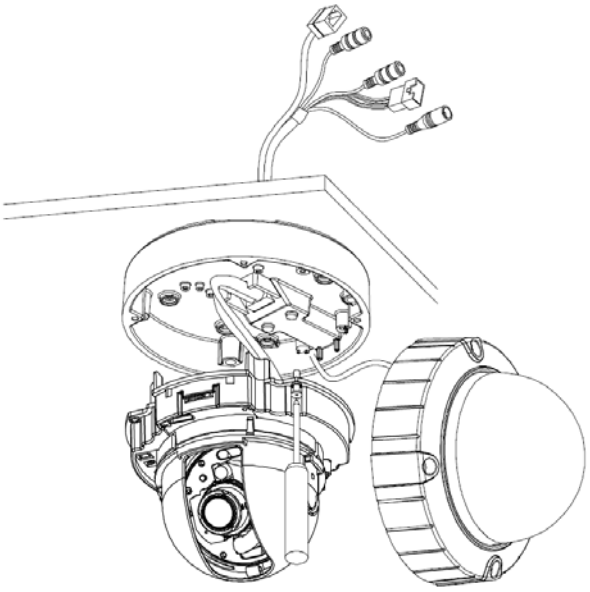
1) IN CEILING MOUNT



2) SURFACE MOUNT



1) IR Ver.



2) No-IR Ver.

# 2. Accessing the Camera

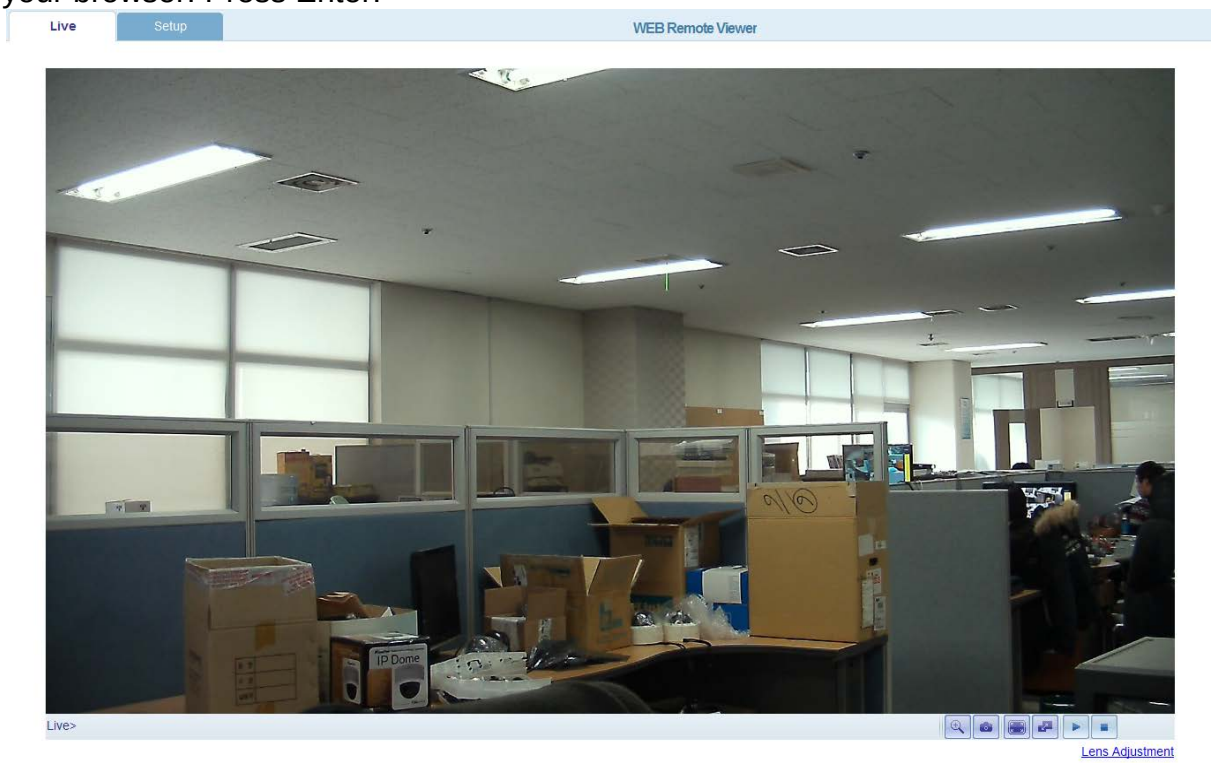
Follow the instructions in the IP VANDAL DOME CAMERA Installation Guide to install the camera.

The IP VANDAL DOME CAMERA could be accessed with most standard operating systems and browsers. The recommended browser is Internet Explorer for Windows with other operating systems.

## 2.1 Access from a browser

1. Start a browser (Internet Explorer)

2. Enter the IP address or host name of the camera in the Location/Address field of your browser. Press Enter.




3. Login dialog will appear when the camera is accessed for the first time.

4. The default user name is **ADMIN**, and password is **1234**.

5. The camera's Live View page is now displayed in your browser.

Note: The layout of the live view page in the camera may have been customized to meet specific requirements. Consequently, some of the examples and functions featured here may differ from those displayed on your own Live View page.

## 2.2 Accessing the camera from the Internet

Once installed, the camera is accessible on the local network (LAN). Configure the router/firewall to allow incoming data traffic to access the camera from the Internet. For security reasons this is usually done on a specific port. Please refer to the documentation for router/firewall for further instructions.

## 2.3 Adjusting the Image and Focus

To adjust the position of the lens:

1. Open the **Live View** page in your web browser.
- Select the **Setup** tab, and open the **Installation** page.
- Select the 'Video Format'.

2. Connect analog monitor to the VIDEO OUT (BNC) on the cable.
- Control the FOCUS with monitor's image.

3. Check the image from the **Live View** page on your web browser.
- Set 'Installation Mode' to 'OFF' to resume normal camera operation.

## 2.4 The Live View page

 Digital Zoom

 Snap Shot

 Full Screen

 Video Stream change: First stream ⇔ Second stream

 Play: Click this button by manually to start the stream

 Stop: Click this button by manually to stop streaming

*NOTE: It is possible that not all the buttons described below will be visible unless the Live View page has been customized to display them.*

## 2.5 Video stream types

## H.264 protocols and communication methods

• **RTP** (**R**eal-time **T**ransport **P**rotocol) is a protocol that allows programs to manage the real-time transmission of multimedia data, via unicast or multicast.

• **RTSP** (**R**eal **T**ime **S**treaming **P**rotocol) serves as a control protocol, to negotiate the type of transport protocol to use for the stream. RTSP is used by a viewing client to start a unicast session.

• **UDP** (**U**ser **D**atagram **P**rotocol) is a communications protocol that offers limited service for exchanging data in a network which uses the Internet Protocol (IP). UDP is an alternative to the Transmission Control Protocol (TCP). The advantage of UDP is that, it is not required to deliver all data and may drop network packets when there is network congestion. This is suitable for live video, as there is no point in re-transmitting old information that will not be displayed anyway.

• **Unicasting** is communication between a single sender and a single receiver over a network. This means that the video stream goes independently to each user, and each user gets own stream. A benefit of unicasting is, in case one stream fails, it only affects one user.

• **Multicasting(Will be supported)** is bandwidth-conserving technology that reduces bandwidth usage by simultaneously delivering a single stream of information to multiple network recipients. This technology is used primarily on delimited networks (intranets), as each user needs an uninterrupted data flow and should not rely on network routers.

## 2.6 How to stream H.264

Deciding on the combination of protocols and methods to use depends on your viewing requirements, and on the properties of your network. Setting the preferred method(s) is done in webpage.

**RTP+RTSP** This method (actually RTP over UDP and RTSP over TCP) should be your first consideration for live video, especially when it is important to always have an up-to-date video stream, even if some images are lost due to network problems. This could be configured as multicast or unicast.

**RTP/RTSP/Multicasting (Will be supported)** provides the most efficient usage of bandwidth, especially when there are large numbers of clients viewing simultaneously. Note however, that a multicast broadcast could not pass a network router unless the router is configured to allow this. For example, It is impossible to multicast over the Internet.

**RTP/RTSP/Unicasting** should be used for video-on-demand broadcasting, so that there is no video traffic on the network until a client connects and requests the stream. However, as more and more unicast clients get connected, the traffic on the network will increase and may cause congestion. Although there is a maximum of 10 unicast viewers, note that all multicast users combined count as 1 unicast viewer.

**RTP/RTSP**
This unicast method is RTP tunneled over RTSP. This could be used to exploit the fact that it is relatively simple to configure firewalls to allow RTSP traffic.

# 3. The Setup

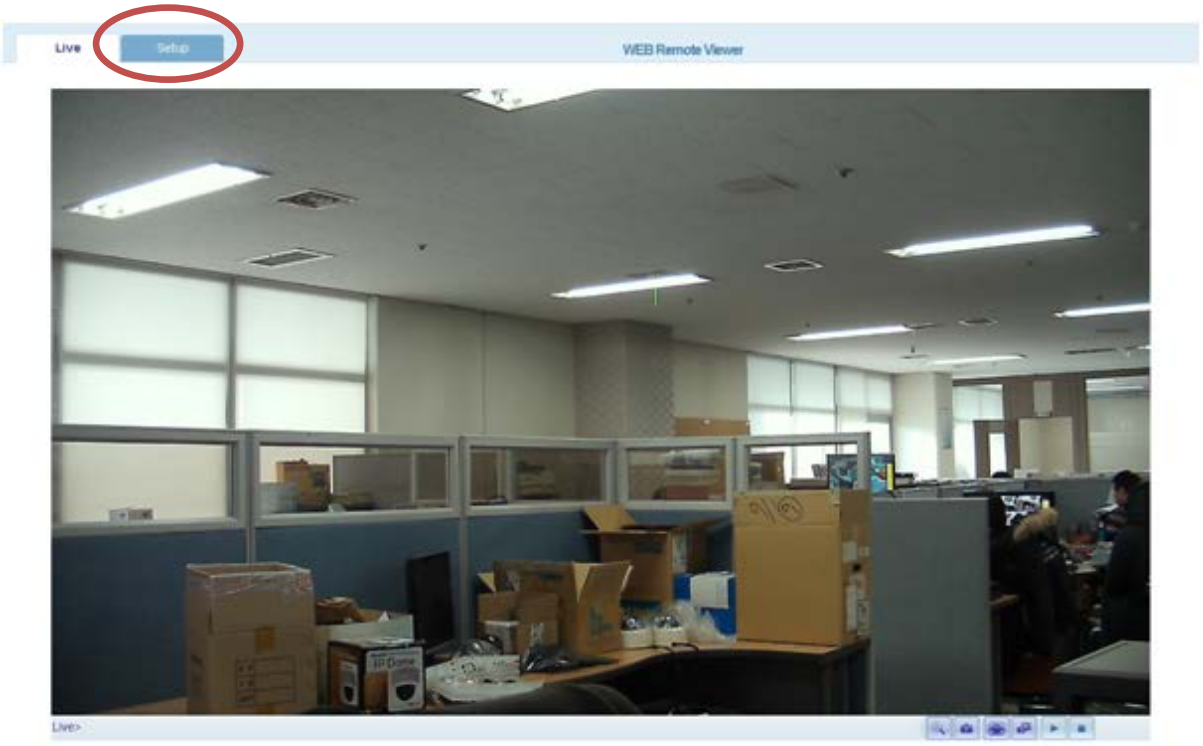
The IP VANDAL DOME CAMERA is configured from the Setup link, which is available on the top left hand side in the web interface. This configuration could be done by:

• **Administrators**, who have unrestricted access to all settings under the Setup tab.

## Accessing the Setup link from a browser

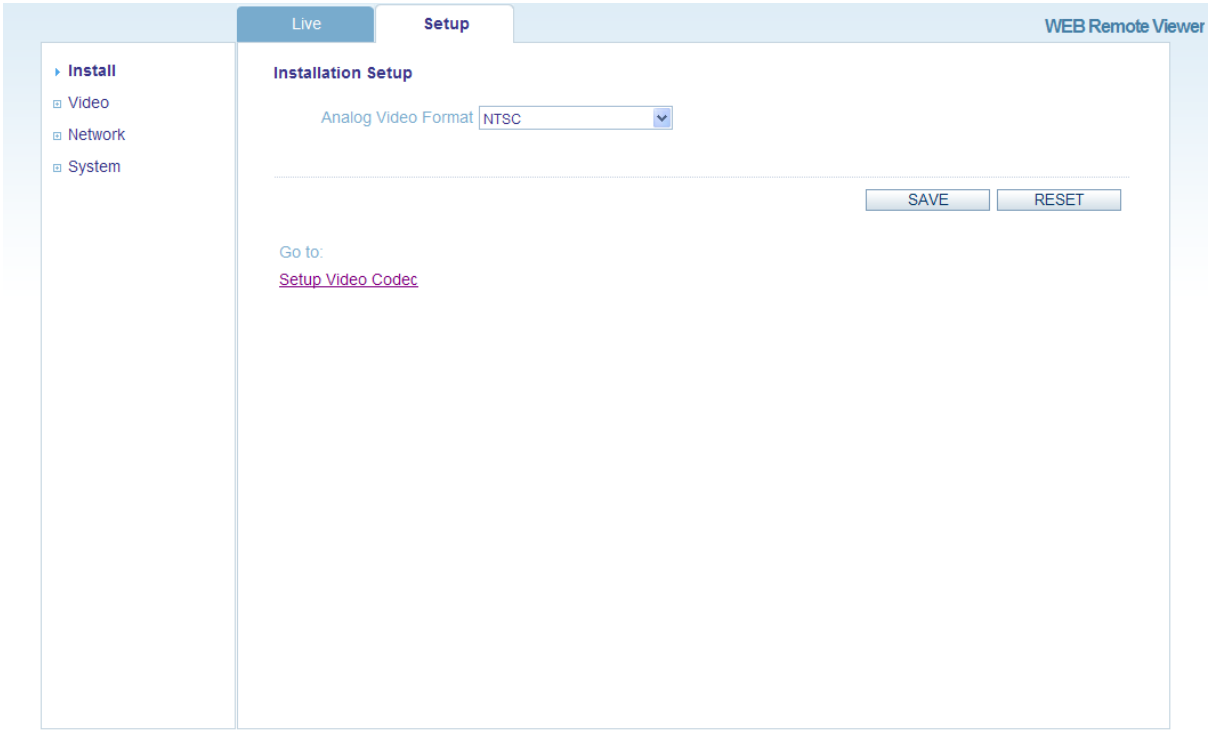
1. Start your web browser and enter the IP address or host name of the camera into the address bar.

2. The Live View page is now displayed. Click on the Setup tap.



# 4. Installation

The following descriptions show examples of some of the features available in the IP VANDAL DOME CAMERA.




## 4.1 Installation Setup

**Installation Mode** allows use of the analog BNC output from the camera to connect the camera

NTSC, PAL: Analog Output is enabled.

# 5. Camera and Image

The following descriptions show examples of some of the features available in the IP VANDAL DOME CAMERA.

## 5.1 Video Codec

These are the tools for adjusting the H.264 settings and controlling the video bit rate.


**H.264**

This is a video compression standard that makes good use of bandwidth and which could provide high-quality video streams at less than 1 Mbit/s.

The H.264 standard provides scope for a large range of different coding tools for use by various applications in different situations, and the IP VANDAL DOME CAMERA provides certain subsets of these tools.

Using H.264, it is also possible to control the bit rate, which in turn allows the amount of bandwidth usage to be controlled. CBR (Constant Bit Rate) is used to achieve a specific bit rate by varying the quality of the H.264 stream. While using VBR (Variable Bit Rate), the quality of the video stream is kept as constant as possible, at the cost of a varying bit rate.

**Codec**

H.264

**Size**

Video output resolution. See the next page for the output resolution table.

**Image rate**

1~30fps in normal mode (1~15fps for slow shutter mode)

Note: *If the slow shutter mode is turned on and the low light condition is met, the frame rate is automatically goes down. In this case, the frame is half of the normal mode.*

**Bit-rate control (CBR or VBR)**

When using H.264 compression, if there is only limited bandwidth available, a constant bit rate(CBR) is recommended, although this may compromise image quality. Use a variable bit rate(VBR) for the best possibly image quality.

**Average Bit-rate (512Kbps ~ 10Mbps)**

Recommended bit rate for D1: 800Kbps ~ 1Mbps
Recommended bit rate for 1.3M(720p): 3Mbps ~ 4Mbps
Recommended bit rate for 2.0M(1080p): 6Mbps ~ 8Mbps

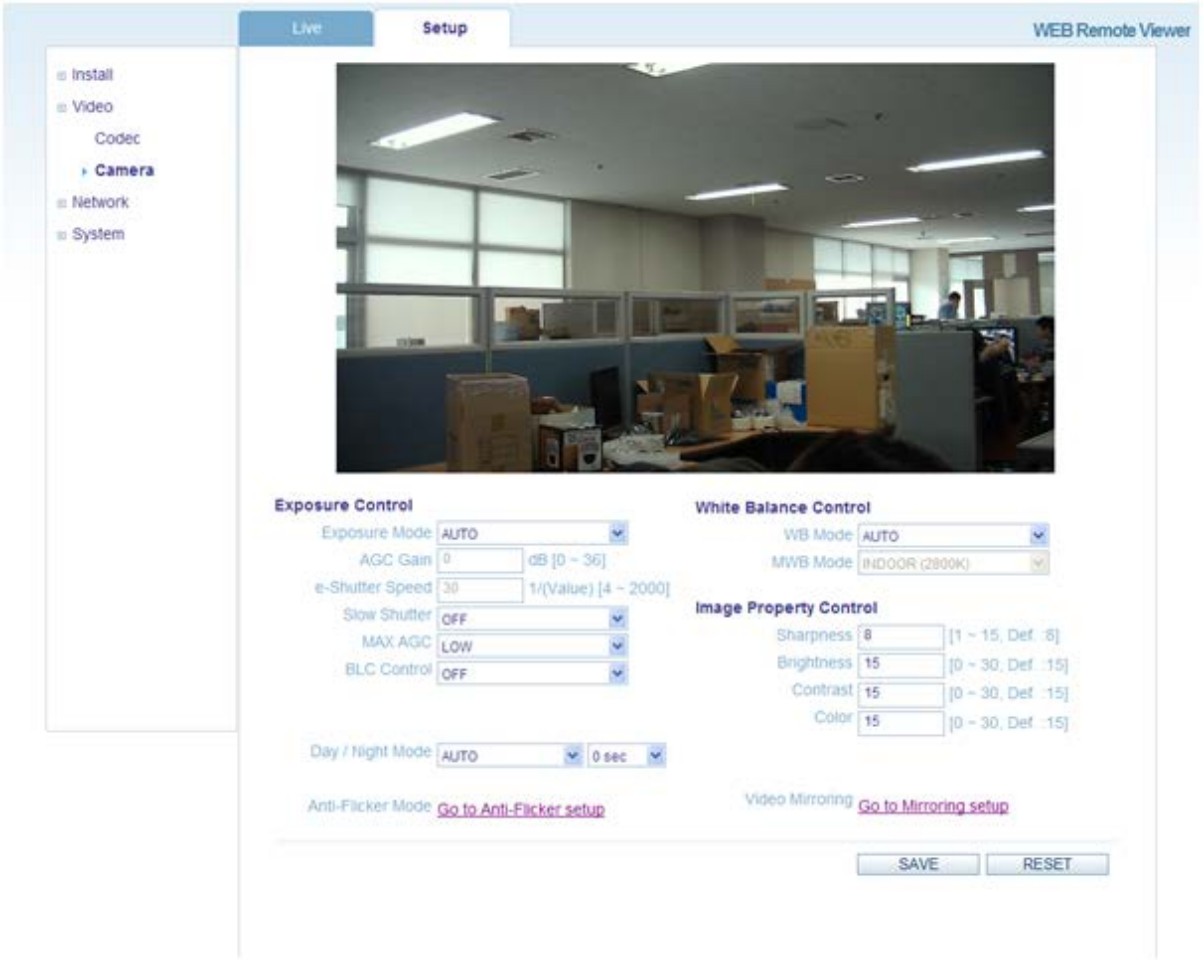
**Anti-Flicker mode (Flicker less mode)**
60Hz:NTSC
50Hz:PALorflicker-free mode(to use the camera in locations lit by fluorescent lighting).

**< Output resolution table for IP VANDAL DOME CAMERA>**

| First Stream | Second Stream | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1920x1080 | 704x480 | 640x480 | 640x360 | 640x352 | 352x288 | 352x240 | 320x240 | - |
| 1280x1024 | 704x480 | 640x480 | 640x360 | 352x288 | 352x240 | 320x240 | - | - |
| 1024x768 | 704x480 | 640x480 | 640x360 | 352x288 | 352x240 | 320x240 | - | - |
| 1280x720 | 1280x720 | 704x576 | 704x480 | 640x480 | 640x360 | 352x288 | 352x240 | 320x240 |
| 704x576 | 704x576 | 640x480 | 640x360 | 352x288 | - | - | - | - |
| 704x480 | 704x480 | 640x480 | 640x360 | 352x240 | - | - | - | - |
| 640x480 | 640x480 | 320x240 | - | - | - | - | - | - |
| 640x360 | 640x360 | 320x240 | - | - | - | - | - | - |
| 352x288 | 352x288 | - | - | - | - | - | - | - |
| 352x240 | 352x240 | - | - | - | - | - | - | - |
| 320x240 | 320x240 | - | - | - | - | - | - | - |

## 5.2 Camera

This section allows you to adjust various camera settings.




## 5.2.1 Exposure Control

**Enable AE (Auto Exposure)**

ON: Use this setting for automatic exposure control.
OFF: Use these settings to control camera exposure manually.

To compensate for poor lighting conditions, you can adjust the Color level, Brightness, Sharpness, Contrast and Exposure control.

NOTE: *When AE is enabled, some of the submenus (AGC Gain, e-Shutter Speed) will be disabled.*

**Slow shutter mode**
For low light conditions, turn on slow shutter mode.

**Max AGC Gain**
For low light conditions, adjust to a higher value, such as 30dB.

**BLC Control (Back Light Compensation)**
The BLC adjusts the exposure of scenes with strong backlight in the center-bottom of the image. When the image background is too bright, or the subject too dark, backlight compensation makes the subject appear clearer. The settings for low light behavior determine how the camera behaves sat low light levels. These settings affect video image quality and how much noise is in the images.

## 5.2.2 Day & Night Control

**Day & Night Mode**

**Auto/Day/Night**- If set to Auto, the camera will automatically switch according to the current lighting conditions.

## 5.2.3 White Balance Control

**WB Mode**

ON:ATW (Automatic White balance)
OFF: MWB (Manual White balance)

The White balance adjustment setting is used to make the colors in the image appear consistent,compensating for the different colors present in different light sources.

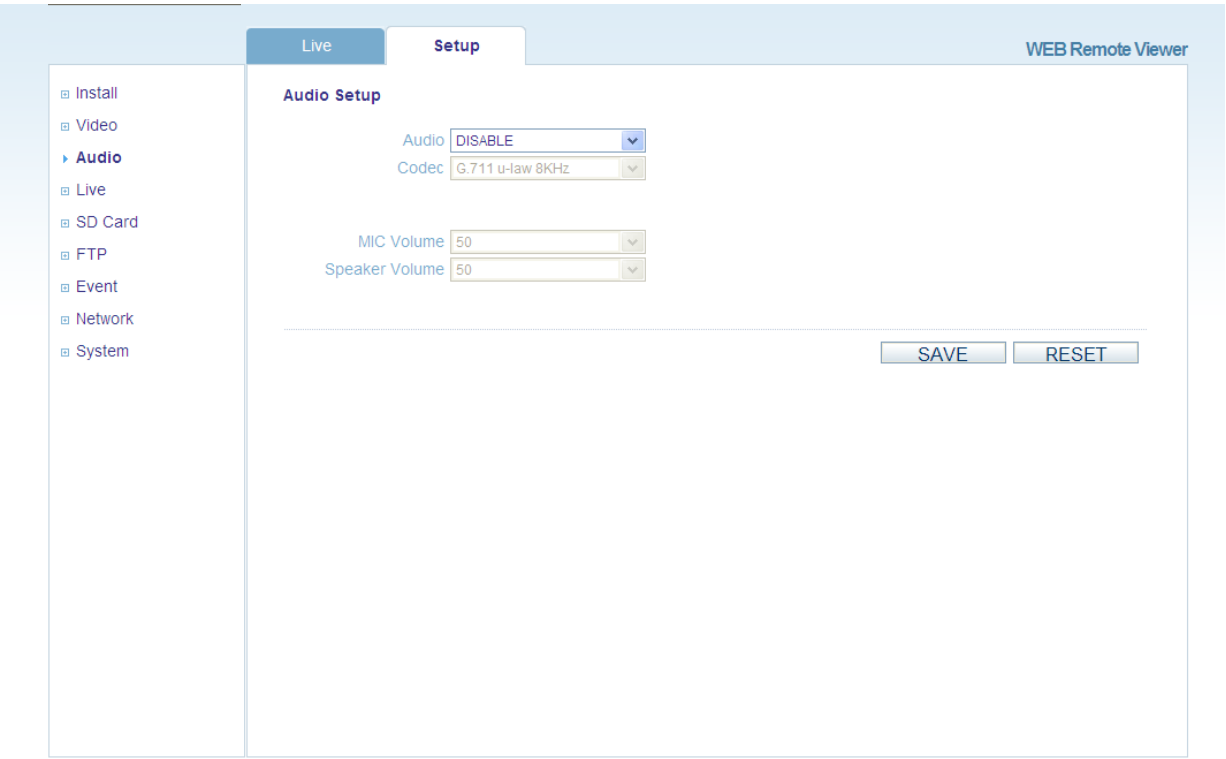
The IP VANDAL DOME CAMERA camera can be set to automatically identify the light source and compensate forits color temperature. If necessary, the type of light source could be set manually..

## 5.2.4 Image Property Control

Modify the video signal parameters, such as: Brightness, Sharpness, Contrast, and Color.

Sharpness (Default: 8, Range: 1~15)
Brightness (Default: 15, Range: 0~30)
Contrast (Default: 15, Range: 0~30)
Color (Default: 15, Range: 0~30)

# 6. Audio




The NCX could transmit audio to other clients, using a connected external microphone and could play audio received from other clients via connected speakers. This section describes how to configure the basic audio settings for the NCX, such as setting the communication mode, adjusting the sound levels in the microphone and speakers connected to the camera.

**Note:** The speakers connected to the audio output must have a built-in amplifier, such as PC speakers.

### Enable Audio

ON/OFF
Check this to enable audio in the NCX.

### Codec

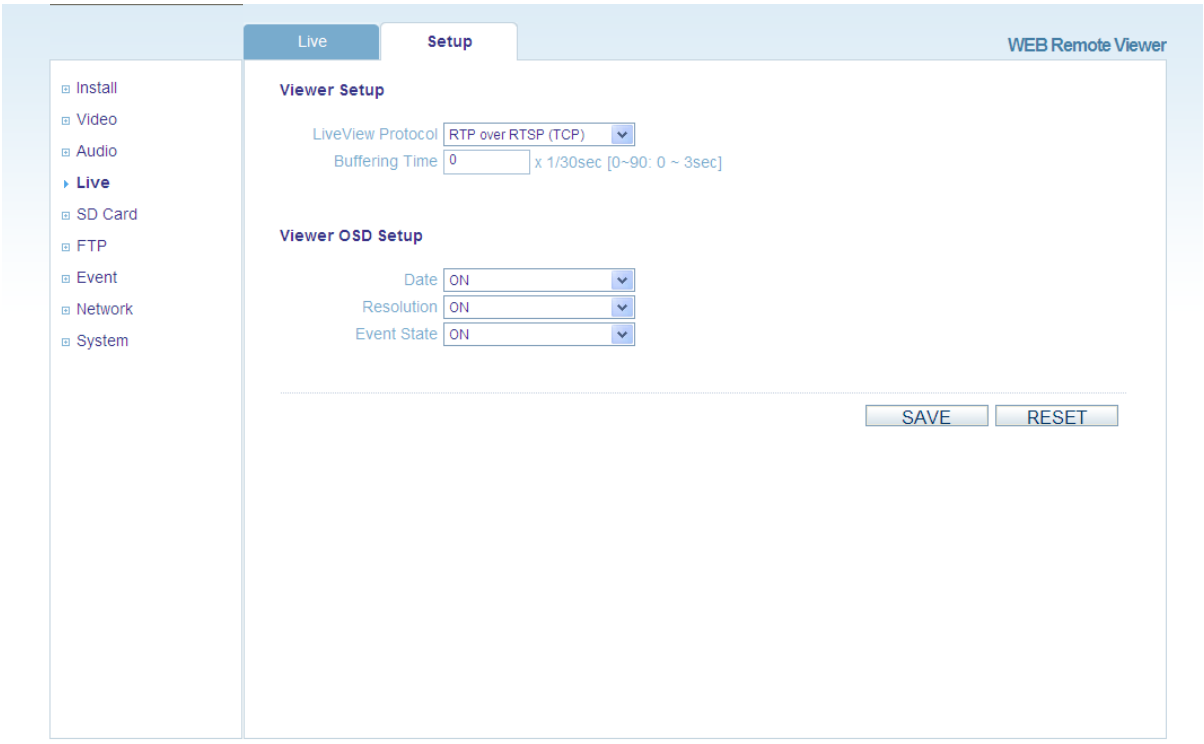
G.711 u-law

### Audio Input

Audio from a connected a line source could be connected to the Audio in connector of the NCX. If there are problems with the sound input being too low or high, adjust the **input gain** for the microphone connected to the NCX.

Select the desired audio **Encoding** format to G711.

# 7. Live




IP VANDAL DOME CAMERA could support 10 simultaneous users. In case of multicast, IP VANDAL DOME CAMERA could support unlimited number of users. If supported on the network, consider using multicasting, as the bandwidth consumption will be much lower.

**Viewer Setup**

LiveView Protocol
RTP Unicast (UDP) / RTP Multicast (UDP) / RTP over RTSP (TCP)

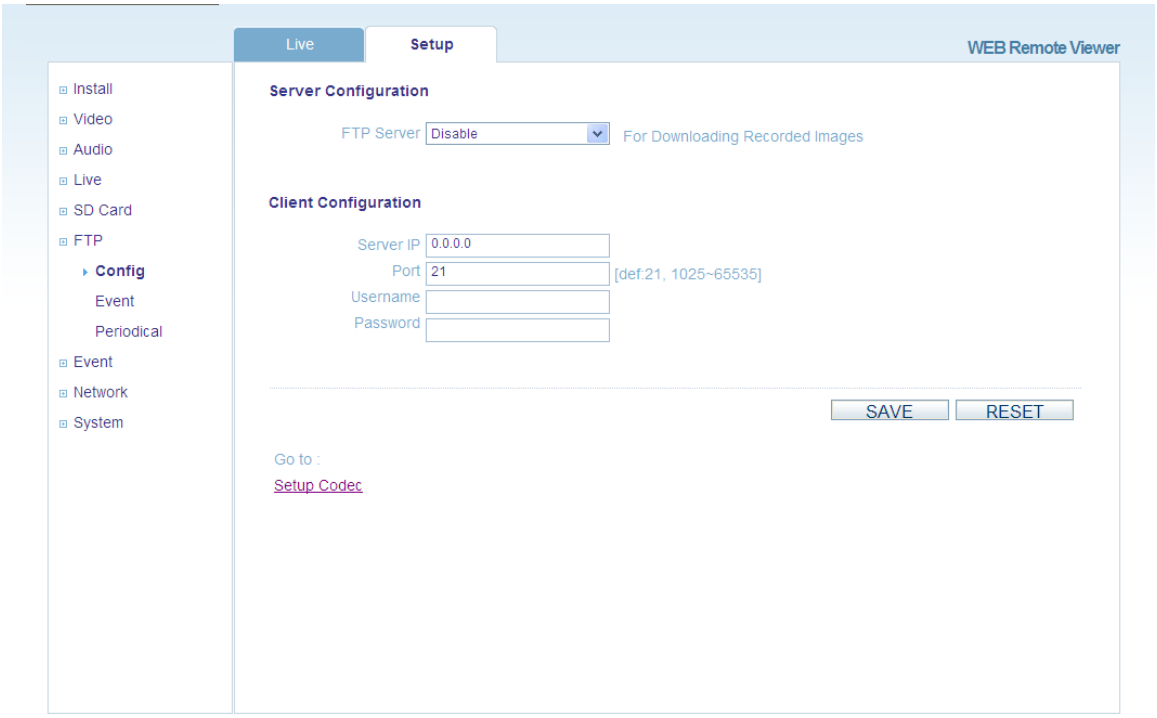
Buffering Time (frame based)
Determines (0 ~ 90) x 1/30 sec (0 ~ 3sec)

**Viewer OSD Setup**

**Date** : Determines whether the date is displayed.
**Resolution** : Determines whether the camera title is displayed.
**Event State** : Determines whether the event state is shown on display window.

# 8. FTP

## 8.1 FTP > Config




**Server Configuration**

It is setting whether to use the provided FTP Server to download the configuration set on the **SD Card** menu remotely. When it is set as Enable, the FTP client could download the saved content without getting the SD Card.

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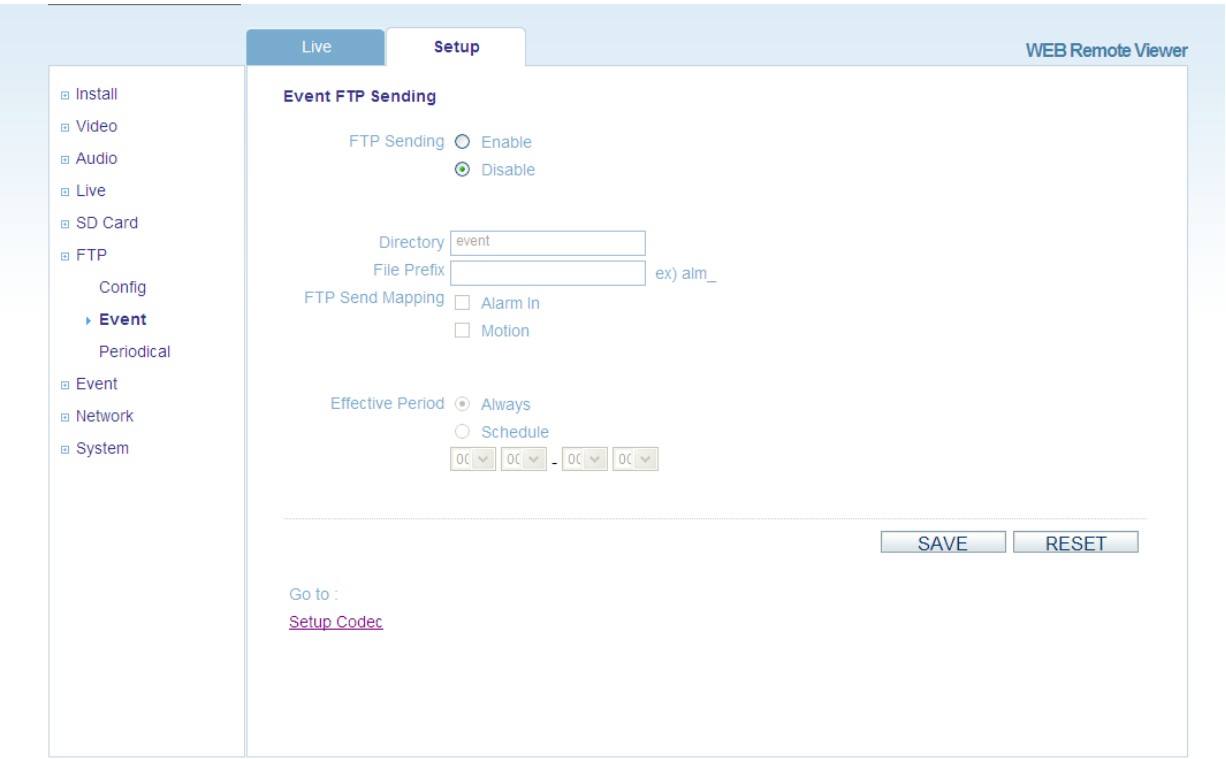
**Client Configuration**

It is setting page to transmit the still shot to remote sites, using the FTP server.
It could not be used when the Installation mode is on. Please set the first stream 1280x720 or 1280x720(wide) in Video-> Codec setting and second stream to MJPEG or None.
Set the information for FTP transmission by inserting the IP address, Username and Password of the remote FTP Server.

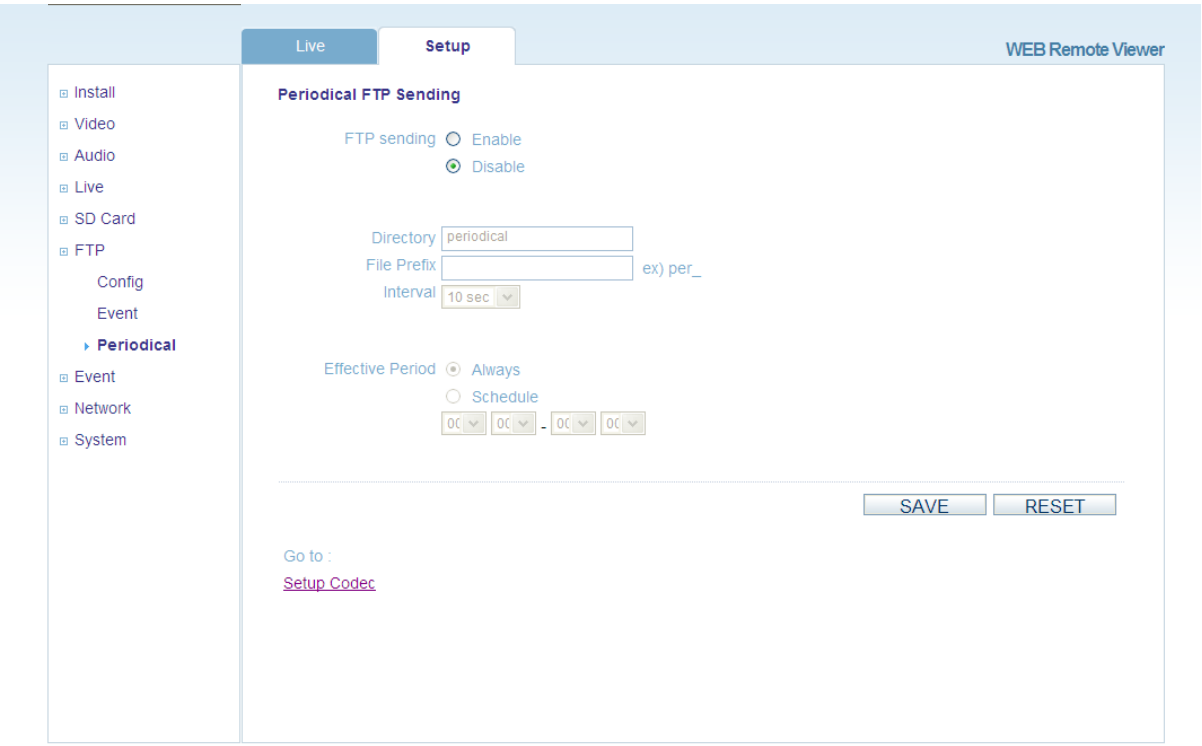
## 8.2 FTP > Event




**Event FTP Sending**

It is setting page to transmit the still shot to the FTP server at remote sites when event such as Alarm In and Motion detection happens. It could not be used when the Installation mode is on. Please set the first stream 1280x720 or 1280x720(wide) in Video-> Codec setting and second stream to MJPEG or None.
The overall menu structure is same as menu structure on SD Card->Event. Difference is that instead of saving the still shot on Alarm In or Motion event, it transmits to the Ftp server set on the Client Configuration of FTP->Config.

# 8.3 FTP > Periodical

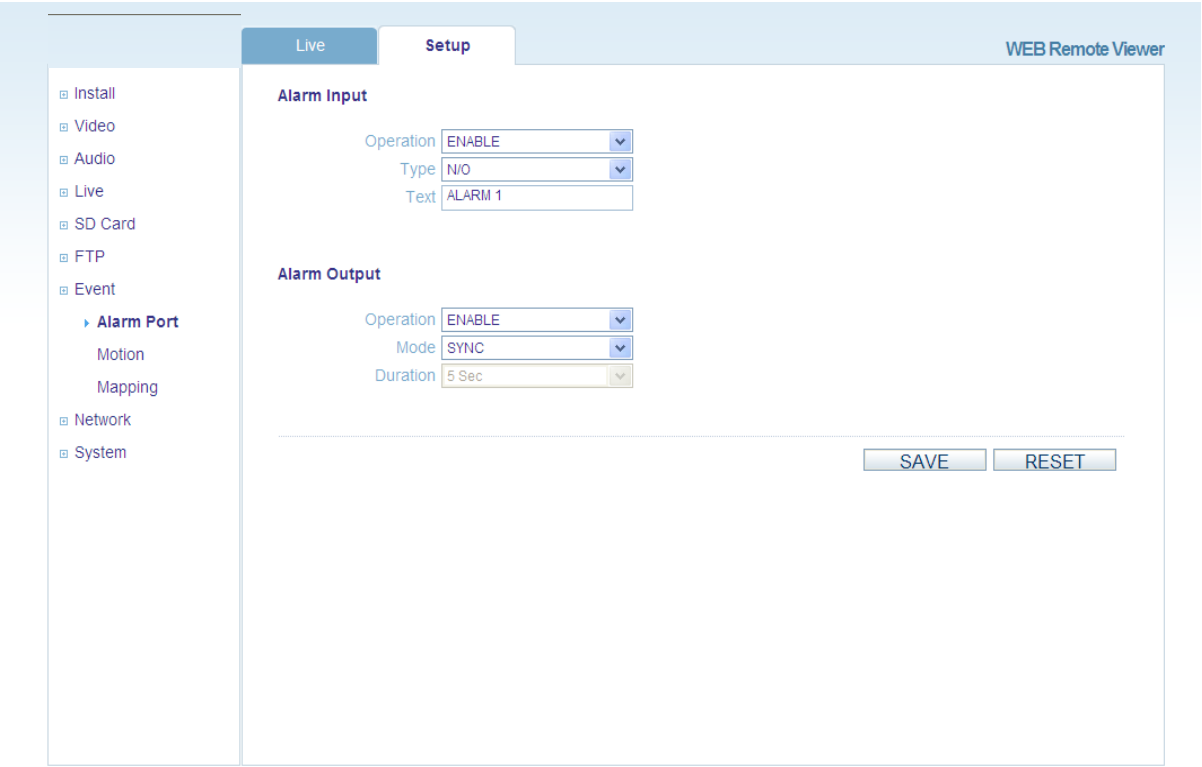



**Periodical FTP Sending**

It is setting page to transmit the still shots periodically to the FTP server of remote sites. Before using the FTP, turn off the Installation mode. Please set the first stream 1280x720 or 1280x720(wide) in Video-> Codec setting and second stream to MJPEG or None.
The overall menu configuration is same as SD Card->Periodical. Difference is that instead of saving the still shot on Alarm In or Motion event, it transmits to the Ftp server set on the Client Configuration of FTP->Config.

# 9. Event

## 9.1 Event > Alarm Port



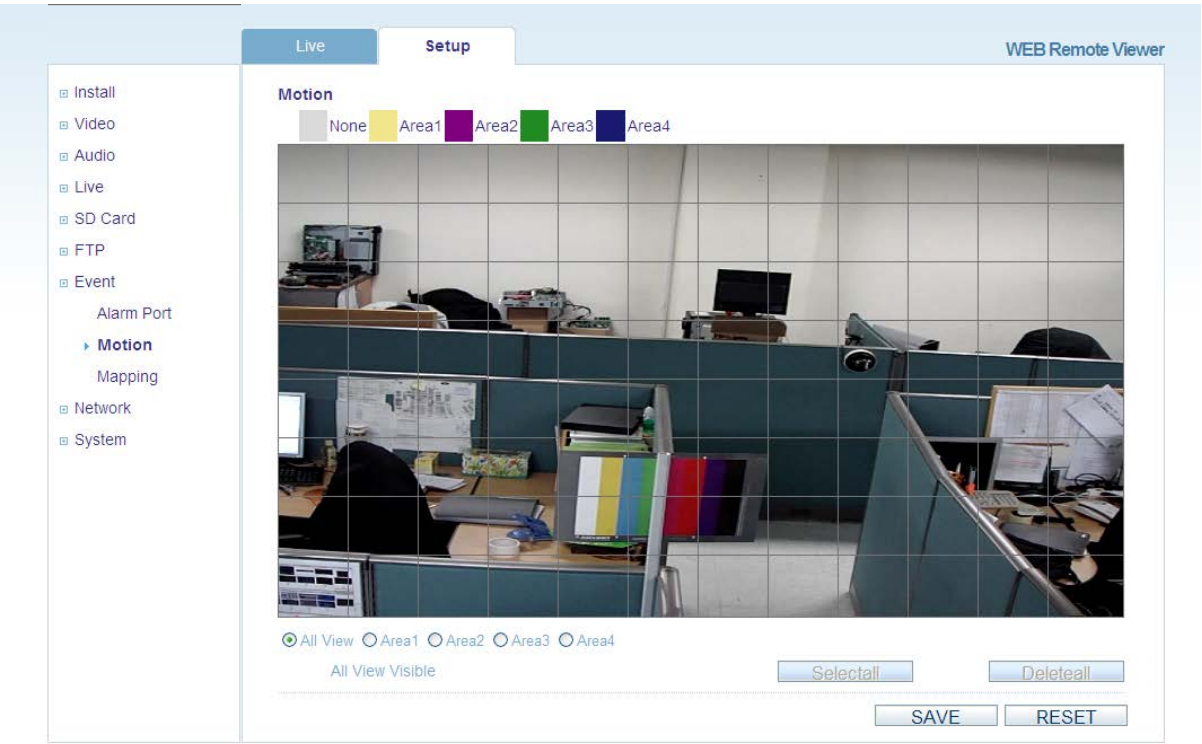

**Alarm Input** - Used for connecting external alarm devices and triggering images for specific alarm-based events. The input is typically connected to a motion detector or any other external security device, and images could be uploaded whenever the detector is activated. Maximum 5VDC is allowed on the input.

**Output** - This could drive a maximum load of 50VDC or 35VAC at 110mA directly or heavier loads by connecting additional relay circuitry. If the output is used with an external relay, a diode must be connected in parallel with the load for protection against any voltage transients.

**Duration -**
This parameter sets the minimum tampering period, that is, an alarm will not be triggered until this period has lapsed, even if the tampering conditions are otherwise met. This could help to prevent false alarms for known conditions that affect the image.

**Caution!** Connecting AC to the inputs/outputs will damage the unit.

## 9.2 Event > Motion




## Motion Detection

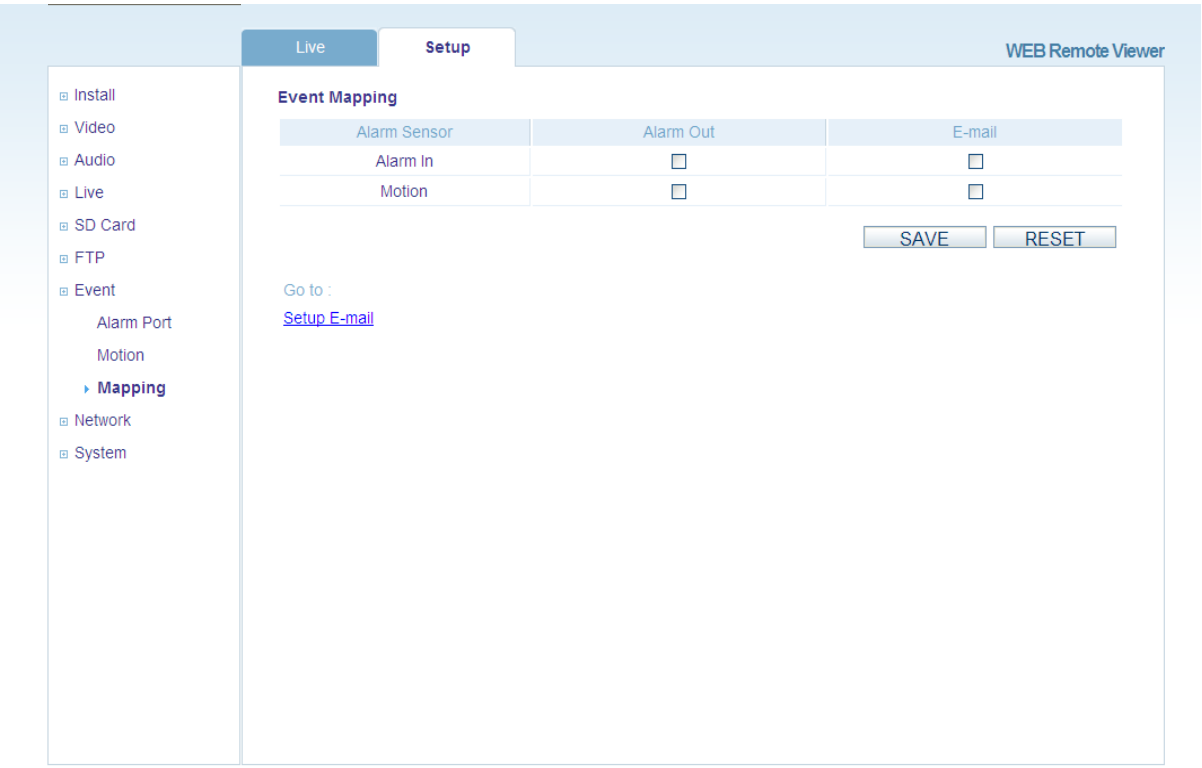
Motion detection is used to generate an alarm whenever movement either occurs or stops in the video image. A total of 10 windows could be configured.

**Configuring Motion Detection**

1. Click **Motion Detection** in the **Event Config** menu.
2. Click Add Window, and select if you want to add an Include or an Exclude window by checking the relevant box.
3. Enter a descriptive name for the window.
4. Adjust the size (drag the bottom right-hand corner) and position (click on the text at the top and drag to the desired position).
5. Adjust the Object size, History and Sensitivity profile sliders (see table below for details). Any detected motion within an active window is then indicated by red peaks in the **Activity** window (the active window has a red frame).
6. Click **Save**.

**Note:** Using the motion detection feature may decrease the camera's overall performance.

# 9.3 Event > Mapping



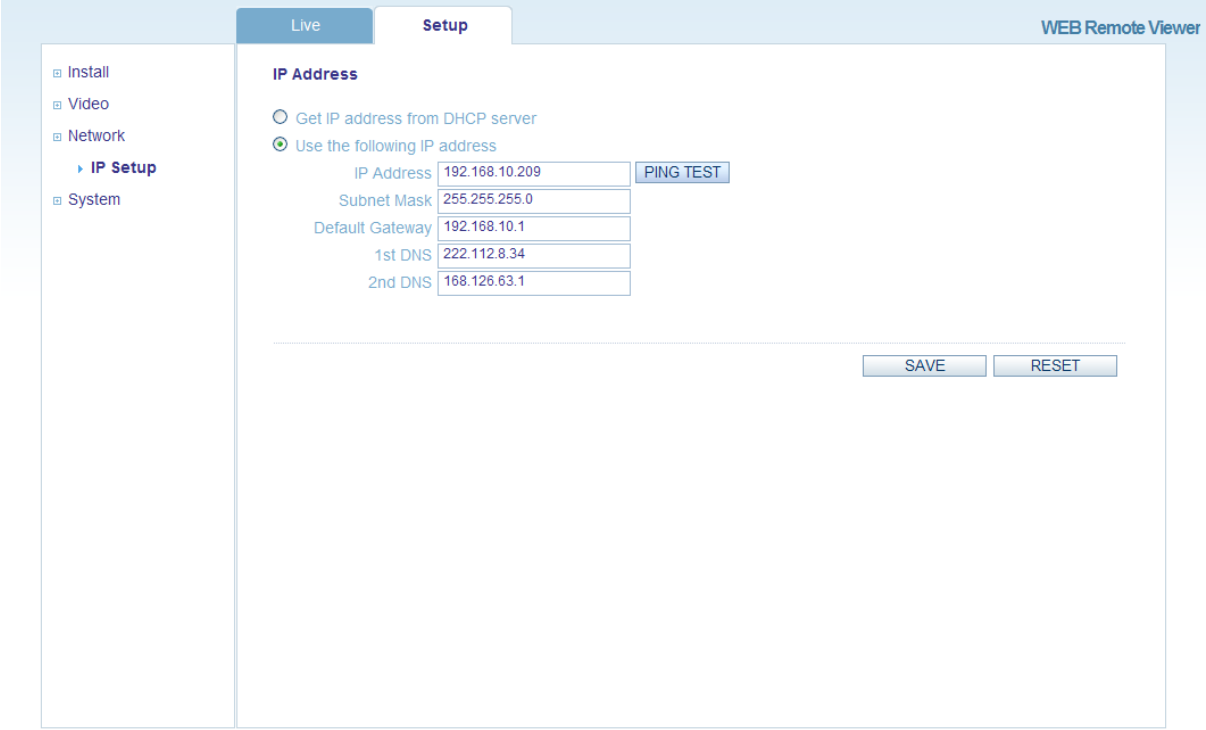

It is possible to define conditions that would cause the camera to respond with certain actions. A triggered event happens as a result of a trigger, which could be motion detection or an external alarm input.

For example,

Alarm out events could be triggered by video motion detection or alarm in.
E-mail could be sent by video motion detection or alarm in.

# 10. Network

## 10.1 Network > IP Setup




**Network Settings**
Click the **Setup > Network > IP Setup** to see the current network settings.

**IP Address Configuration -**
The IP VANDAL DOME CAMERA supports both IP version 4 and IP version 6 **(IPv6 will be supported in V3.00)**. Both versions may be enabled simultaneously, and at least one version should be always enabled.

When using IPv4, the IP address could be set automatically via DHCP, or a static IP address could be set manually. If IPv6 is enabled, your camera receives an IP address according to the configuration in the network router.

There are also options for setting up notification of changes in the IP address, and for using the Internet Dynamic DNS Service.

**Notes: • *To receive notification whenever the camera's IP address changes (via e.g. DHCP), configure the options for notification of IP address change. See Services below. • If your DHCP server could update a DNS server, you could access the IP VANDAL DOME CAMERA by a host name which is always the same, regardless of the IP address.***

**DNS Configuration**

DNS (Domain Name Service) provides the translation of host names to IP addresses on your network.

**•Primary DNS server**

Enter the IP address of the primary DNS server for your network.

**•Secondary DNS server**

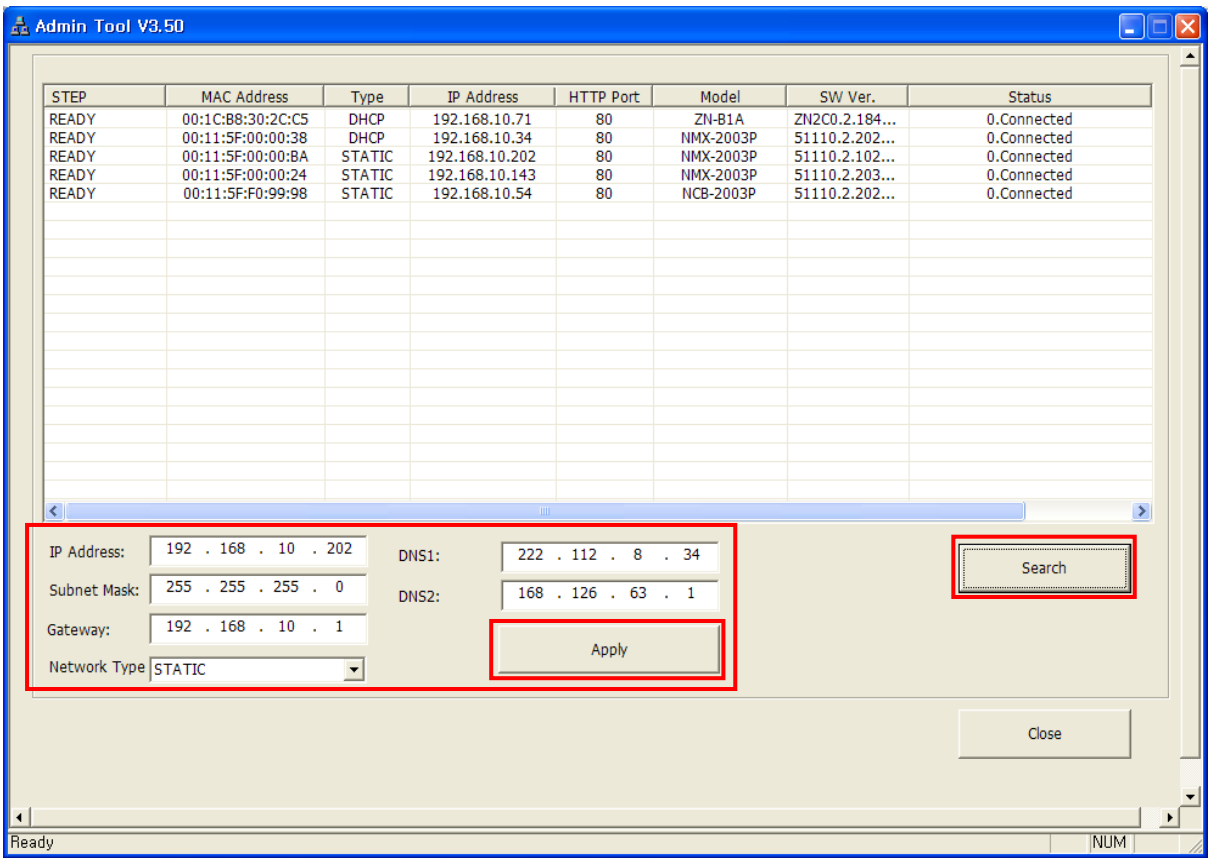
Enter the IP of the Secondary DNS, which is used if the Primary DNS server is unavailable.

## How to assign IP address

Default setting is set to “DHCP” and “UPnP” function is set to ON. If your network has DHCP server and UPnP function is enabled on your PC, you can find the network camera in “My network”.

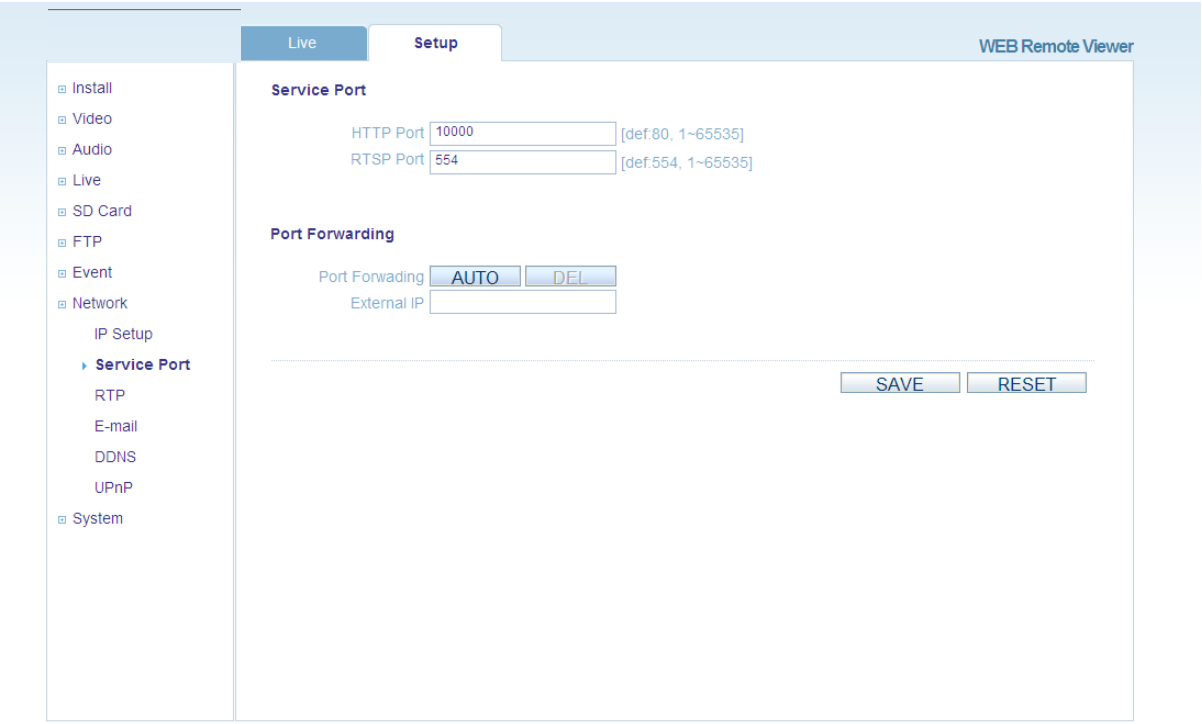
If DHCP server is not available in your network, please assign IP address as following process.

1) Execute Admintool.exe and click “Search” button.
2) After the camera is listed in camera list, select the camera.
3) Type in the all network information.
4) Click “Apply” button, the setting will be showed in the list.
5) Click “Setting” Button to set network information to the camera.




When you double-click the camera within the list, the default web browser (Internet Explorer or compatible equivalent) will open and automatically connect to the camera.

## 10.2 Network > Service Port




### Service Port

**HTTP port-** The default HTTP port number **(80)** could be changed to any port within the range 1-65535. This is useful for simple port mapping.

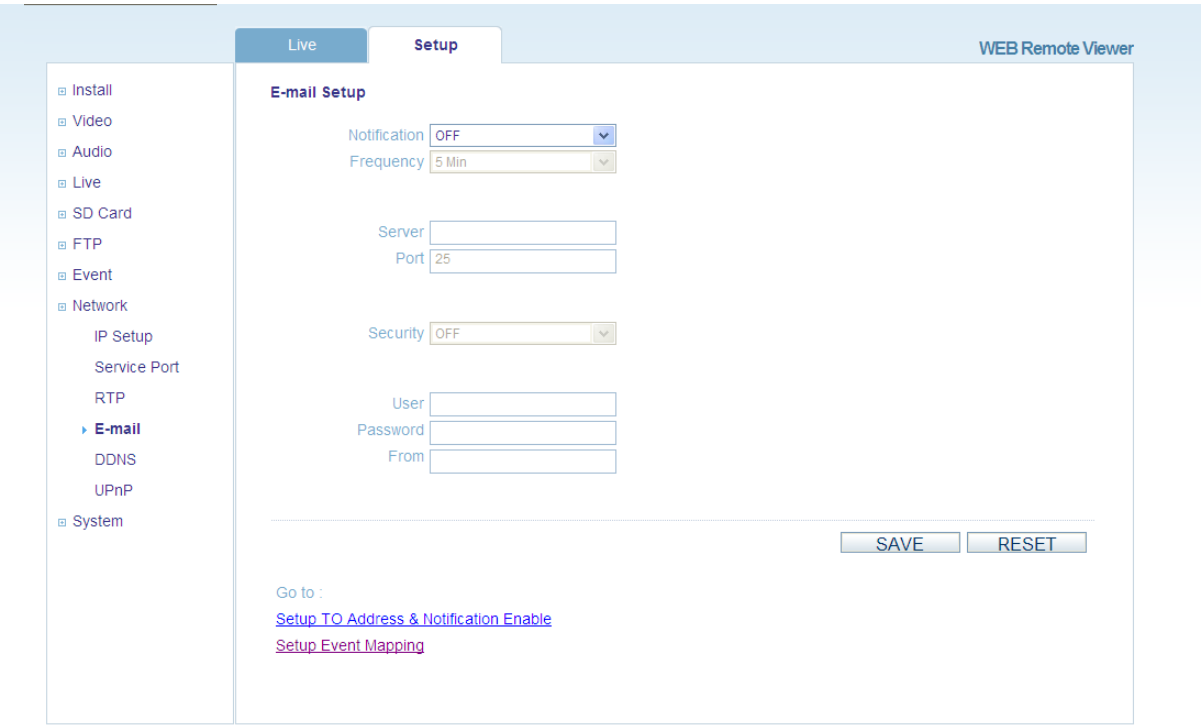
**RTSP port-** The RTSP protocol allows a connecting client to start an H.264 stream. Enter the RTSP port number to use. The default setting is 554.

**HTTPS port (HTTPS will be supported in V3.00) -** The default HTTPS port number **(443)** could be changed to any port within the range 1024-65535. HTTPS is used to provide encrypted web browsing.

**RTP port range -** These settings are the IP address, port number, and Time-To-Live value to use for the video stream(s) in multicast H.264 format. Only certain IP addresses and port numbers should be used for multicast streams.

***Note) After changing the default port to any other ports, the user can forget the ports number. In this case, please use the "ADMIN Tool" to search and connect automatically.***

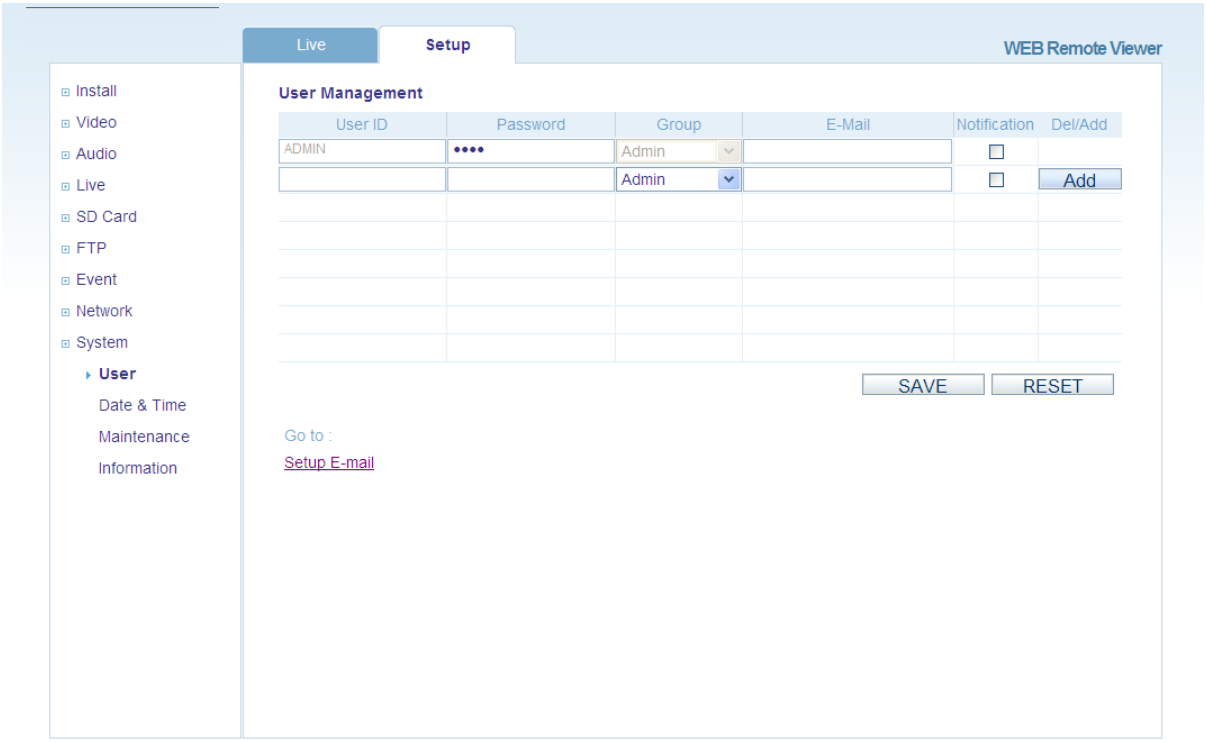
## 10.3 Network > E-mail




Enter the host names or addresses for your mail servers in the fields provided, to enable the sending of event and error email messages from the camera to predefined addresses via SMTP.

# 11. System

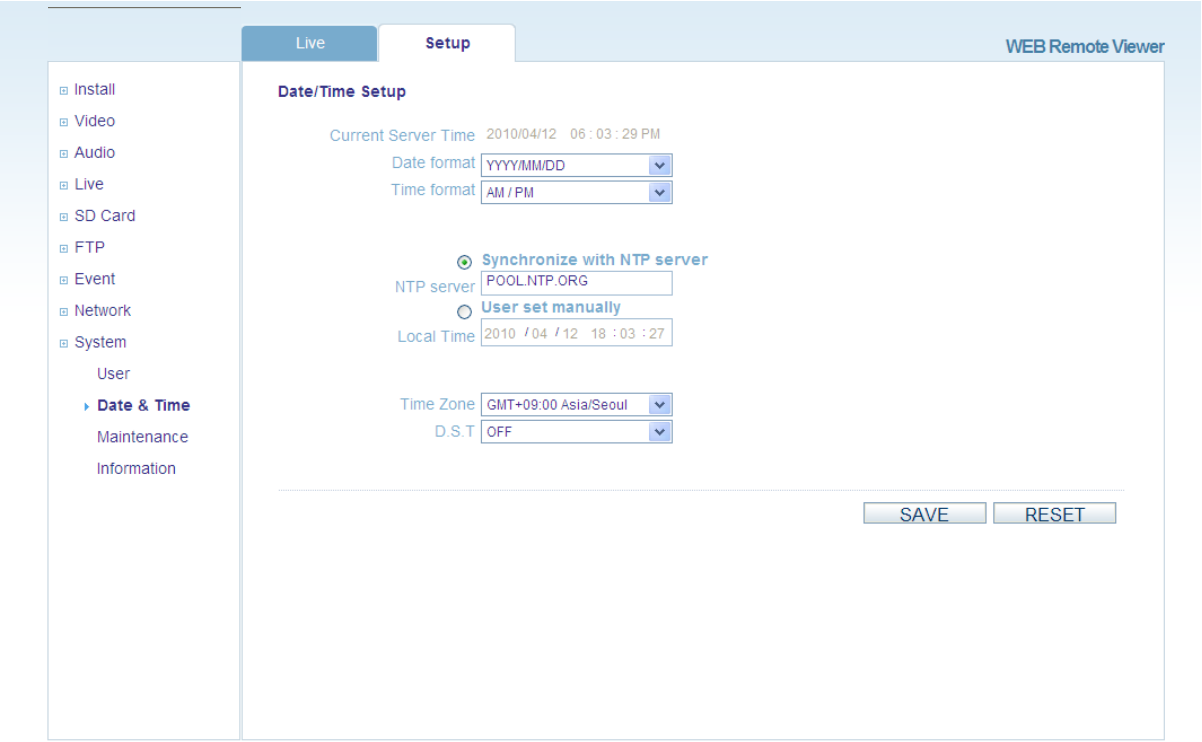
## 11.1 System > User




Access the camera and the **Configure Root Password** dialog appears.
Enter the User name: **ADMIN** and password is 1234.
To changed password or add a user click SETUP > SYSTEM > USER. Fill the User ID, Password and E-mail server. Select Group. Then press ADD button and click SAVE.

***Note:*** *The default administrator user name* ***ADMIN*** *is permanent and could not be deleted or altered.*

## 11.2 System > Date & Time



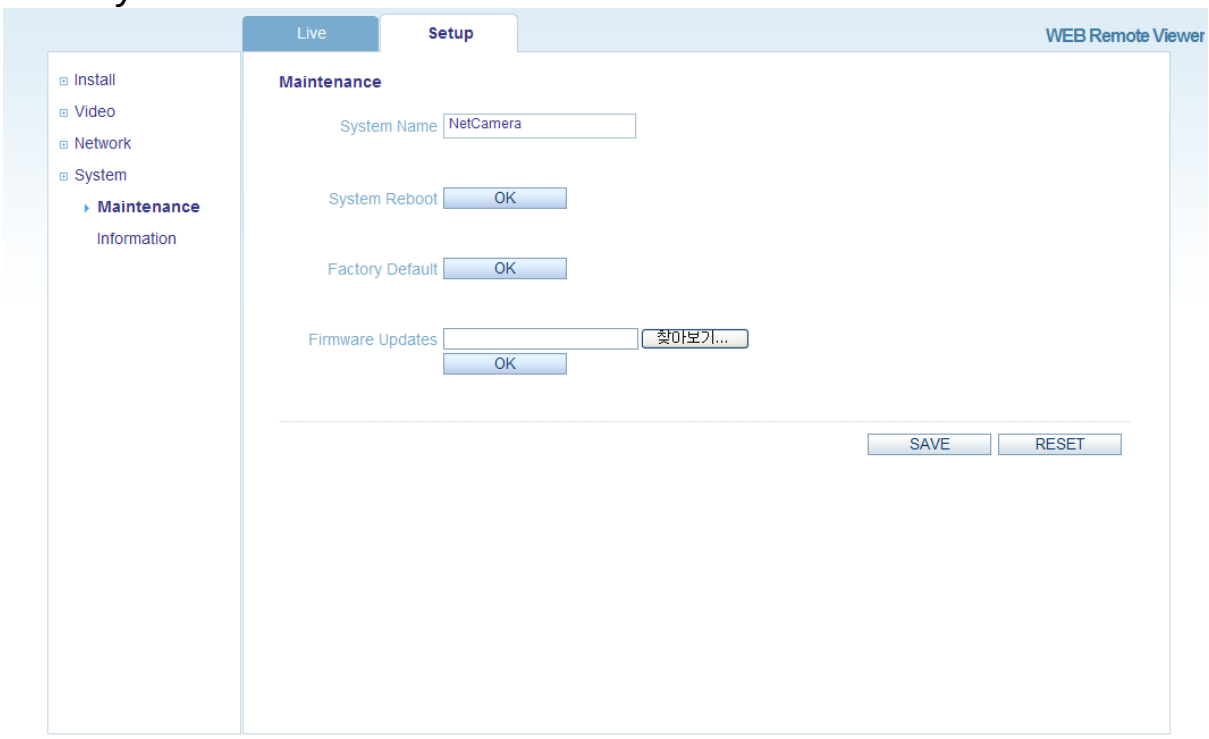

**Date & Time Format** - specify the formats for the date and time (12h or 24h) displayed in the Live View video streams. Use the predefined formats or use your own custom date and time formats.

**Network Time Server** - the camera will obtain the time from an NTP server every 60 minutes. Specify the **NTP server**'s IP address or host name.

**Time zone setup** – Select your time zone from the drop-down list.

**D.S.T (Daylight Saving Time)** - ON/OFF

## 11.3 System > Maintenance




**System Name**
Choose a system name to identify the camera when using e-mail notifications.

**System Reboot**
Reboot the camera.

**Factory Default**
To reset the camera back to the original factory default settings.

**Firmware Update**
From time to time, ITX will release firmware updated for the IP VANDAL DOME CAMERA camera, which will contain feature additions and other improvements. Always read the upgrade instructions and release notes that accompany each new firmware release, before updating the firmware.

NOTE: *Preconfigured and customized settings should be saved before the firmware is upgraded.*

**Firmware Update Procedure**

1. Save the firmware file to your computer.

2. Go to Setup > System > Maintenance within the camera web browser setup.

3. In the Firmware Update section, browse to the desired firmware file on your computer. Click OK.

NOTE: *Do not disconnect power to the unit during the upgrade. The unit will restart automatically after the upgrade has completed. (1~5 minutes)*

4. If you suspect the firmware upgrade for the camera has failed, always wait at least 5-10 minutes before restarting the upgrade process.

5. ITX reserves the right to charge for any camera repair which can be attributed to faulty upgrading by the user. Always read the upgrade instructions and firmware release notes before updating the firmware.

**System Reset (Factory Default Reset)**

There are two ways to reset the camera back to factory default. holding down about 10-20 sec the reset button on the Network cable

*Using the web browser:*

1. Go to SETUP > System > Maintenance.

2. Click Factory Default Button and wait 1 minute for camera to reboot.

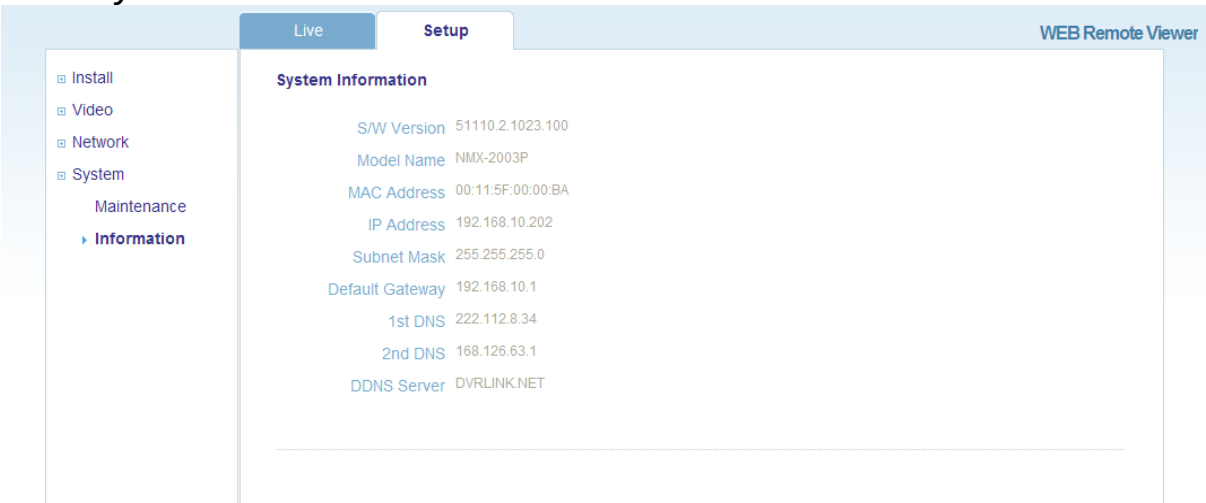
*Using the Reset Button:*

1. Holding down 10-20 sec the reset button on the Network cable.

2. Release your finger on the reset button, waiting about 1 minute for camera reboot

NOTE: *The unit will now have the default IP address from a DHCP server.*
*Use the 'ADMIN Tool' to discover and connect to the camera.*

## 11.4 System > Information

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# 12.DIMENSION (mm)